

1.(two times amended)

A process for overmolding tubes comprising the steps of:

inserting a tube of a first polymer, having an inner diameter, at least partially into a mold and at least partially onto a cylindrical mandrel, the mandrel having a base and a tip, an outer diameter of said mandrel dimensioned so as to allow the inner diameter of the tube to slide thereon, said mold containing a void for receiving a second polymer, the void co-acting with the mandrel and the tube to define an overmolding shape;

injection molding the second polymer over the tube and the mandrel in the void of the mold; and

crosslinking the first and second polymers, wherein the step of crosslinking independently increases the degree of crosslinking of each polymer to a higher final amount.

66. (amended)

The process of claim 1 wherein

the first and second polymers are polyethylene [and each is independently crosslinked to an initial degree and wherein the step of crosslinking independently increases the degree of crosslinking of each polymer to a higher final amount].

67. (amended)

The process of claim ~~66~~ wherein

[the] an initial degree of crosslinking of each of the first and second polymers is in the range of from about 35% to about 50% and the final degree of crosslinking of each of the first and second polymers is greater than or equal to about 50%.

<sup>16</sup>  
~~77~~. The process of claim ~~66~~ wherein

the first polymer is a high density polyethylene and

the second polymer is a low density polyethylene.--

<sup>17</sup>  
~~78~~. The process of claim ~~66~~ wherein

the first polymer is a low density polyethylene and

the second polymer is a high density polyethylene.--

<sup>18</sup>  
~~79~~. The process of claim 1 wherein

at least one of the first and second polymers is at least partially  
crosslinked before the step of crosslinking.--

<sup>19</sup>  
~~80~~. The process of claim 1 wherein

an initial degree of crosslinking of the first polymer is less than an initial  
degree of crosslinking of the second polymer.--

<sup>20</sup>  
~~81~~. A process for overmolding tubes comprising the steps of:

inserting a tube of a first polymer having a first polymer initial degree of  
crosslinking, said first polymer having an inner diameter, at least  
partially into a mold and at least partially onto a cylindrical mandrel,  
the mandrel having a base and a tip, an outer diameter of said  
mandrel dimensioned so as to allow the inner diameter of the tube  
to slide thereon, said mold containing a void for receiving a second  
polymer, the void co-acting with the mandrel and the tube to define  
an overmolding shape;

injection molding a second polymer having a second polymer initial  
degree of crosslinking, said initial degrees of crosslinking being  
selected independently for the first and second polymers, over the  
tube and the mandrel in the void of the mold; and

crosslinking the first and second polymers to a final degree, said final  
degree of crosslinking for the first and second polymers being

selected independently for the first and second polymers.--

<sup>21</sup>  
--82. The process of claim <sup>20</sup>~~81~~ wherein

an initial degree of crosslinking of each of the first and second polymers is in the range of from about 35% to about 50% and the final degree of crosslinking of each of the first and second polymers is greater than or equal to about 50%.--

<sup>22</sup>  
--83. The process of claim <sup>20</sup>~~81~~ wherein

the first polymer is a high density polyethylene and  
the second polymer is a low density polyethylene.--

<sup>23</sup>  
--84. The process of claim <sup>20</sup>~~81~~ wherein

the first polymer is a low density polyethylene and  
the second polymer is a high density polyethylene.--

<sup>24</sup>  
--85. The process of claim <sup>20</sup>~~81~~ wherein

an initial degree of crosslinking of the first polymer is less than an initial degree of crosslinking of the second polymer.--

### Status

The application presently contains the following claims:

<i>Independent Claim #</i>	<i>Dependent Claim #s</i>
1	63-80
81	82-85

Claims 1 and 66-67 have been amended while claims 77-85 are newly added. Support for the claim amendments and new claims may be found as follows:

<i>Claim #</i>	<i>Support</i>
1	Claim #66.
77	Page 5, lines 20-22 of the specification.
78	Page 6, lines 5-9 of the specification.
79	Page 5, lines 25-27 of the specification.
80	Claim #6 as originally filed.
81	Claim #12 as originally filed.
82	Claim #67.
83	Page 5, lines 20-22 of the specification.
84	Page 6, lines 5-9 of the specification.
85	Claim #6 as originally filed.

No claims have been deleted. Dependent claims 63-65 and 68-76 are resubmitted without amendment.

The examiner has indicated that claims 66-67 and 75-76 are objected to as being dependent upon a rejected base claim, but which would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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***35 U.S.C. §112 Rejection, first paragraph & Responsive Arguments***

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No rejections are pending in this application.

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***35 U.S.C. §112 Rejection, second paragraph & Responsive Arguments***

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No rejections are pending in this application.

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***35 U.S.C. §102 Rejection & Responsive Arguments***

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There are no pending rejections under this section.

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**35 U.S.C. §103 Rejection & Responsive Arguments**

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The examiner has rejected claims 1 and 63-65 and 68-74 under this section, subparagraph (a) as being unpatentable over Weinstein ('647). The examiner indicates that although Weinstein fails to specifically teach crosslinking, it is well-known and conventional in the polymer arts to crosslink resins to provide additional strength.

Applicant Rowley would respectfully request the examiner to re-evaluate her initial conclusion in light of the following arguments. First, as shown in Weinstein, particularly with reference to Fig. 2, each end of extruded tube 24 has a machined section 26 which is formed with a surface that facilitates a weld line formation between machined section 26 and overmolded section 18. Machined section 26 is preferably formed by cutting, as on a lathe, but could be molded instead. See specification of '647, col 2, lines 30-36. What is important to recognize is that this grooved section is used as a mechanical attachment to the extruded tube. There is no teaching within the Weinstein reference that these grooves can be eliminated.

By contrast, the Rowley invention uses a material-to-material bond rather than a mechanical attachment and achieves a superior overmold bond without having to either separately mold a grooved section or alternatively, cut a series of grooves in the tube on a lathe.

Additionally, while the applicant agrees that crosslinking is well known to improve polymer strength, it is submitted that there is no teaching in any of the reference which the examiner has brought to bear on the patentability of the invention which teaches the ability to independently control the final degree of crosslinking in both the polymeric composition of the tube and the polymeric composition of the overmolded polymer. As illustrated in the specification, this independent control is achieved by choice of materials or by the amount of crosslinking catalyst in the respective polymers or by the manner in which the polymers are crosslinked.

One of the keys is that the polymers are not fully crosslinked prior to the step of overmolding. This enables at least some material-to-material bond with the overmolded polymer and permits additional strength to be acquired by both the overmolded polymer and polymer tube through additional crosslinking. It is possible for both the tube and overmolded polymer to initially have no crosslinking, and through choice of polymer composition and/or crosslinking catalyst amount, to independently increase the crosslinking percentage in both polymers to some higher percentage from their initial

non-crosslinked state. It is also possible for the polymers to be different with no initial degree of crosslinking (e.g., low density polyethylene tube and high density overmolded polyethylene) and even though exposed to the same amount of electron beam radiation, will result in independent higher degrees of crosslinking in both the tube and overmolded polymer. It is also possible that the polymer composition for both the tube and overmolding polymer are the same, but crosslinked to different initial degrees, which through further crosslinking, result in independent higher degrees of final crosslinking.

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### ***Request for Reconsideration***

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Applicant believes that independent claims 1 and 81 clearly define over the prior art and that the distinctions between the present invention and the prior art would not have been obvious to one of ordinary skill in the art. Additionally, claims 63-80 depend from and contain all of the limitations of amended claim 1; and claims 82-85 depend from and contain all of the limitations of newly added claim 81 and by the limitations contained in the base independent claims, are felt to be patentable over the prior art by virtue of their dependency from independent claims which distinguish over the prior art of record. All pending claims are thought to be allowable and reconsideration by the Examiner is respectfully requested.

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### ***Fee Determination Record***

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A "Patent Application Fee Determination Record" is attached to this amendment which indicates that an additional fee in the amount of \$36.00 is required for payment of four (4) additional dependent claims presented in this amendment. A check in the amount of \$36.00 is enclosed. The Commissioner is hereby authorized to charge any additional fees which might be required or credit any overpayment to effect the filing of this document to Account No. 50-0983.